

ON-CHIP COMPENSATION CONTROL FOR VOLTAGE REGULATION

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ABSTRACT OF THE DISCLOSURE

Manufacturing and/or operational variations that affect performance of an integrated circuit (IC) are at least partially compensated for, by determining the magnitude of these variations and providing one or more corresponding control signals
10 to a voltage regulator, which, responsive thereto, increases or decreases the magnitude of the output voltage. The output voltage of the voltage regulator is typically provided to a power supply node of the IC. Similarly, the output of the voltage regulator may be provided to a substrate portion of the IC, so as to provide a substrate bias that is variable in response to changes in the performance of the IC. In various
15 embodiments, a determination of the magnitude of the variations is made by comparing the performance of a digital delay circuit or a ring oscillator to a reference clock; speed characterization of the IC may be obtained from the voltage regulator control signals; and information regarding reliability degradation of the IC may be obtained from the control signals that are generated for control of the voltage regulation circuitry.

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